

Amendments to the Drawings:

The attached sheet of drawings includes changes to FIG. 3B. This sheet, which includes FIGs. 3A and 3B, replaces the original sheet including FIGs. 3A and 3B. In FIG. 3B, the word “RUNING” has been corrected to read “RUNNING.”.

Attachment: Replacement Sheet
 Annotated Sheet Showing Changes

REMARKS/ARGUMENTS

1. The Examiner rejected claims 37-42, 47, 54-57, and 61 under 35 U.S.C. § 102(b) as being anticipated by Dierker (U.S. Patent No. 6,229,279). Claims 43-45 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dierker. Claim 46 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Dierker in view of Geibl et al. (U.S. Patent No. 6,143,438). Claims 48-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dierker in view of Dougherty et al. (U.S. Patent No. 5,162,164). Claims 51-53 were rejected under as being unpatentable over Dierker in view of van der Merwe (U.S. Patent No. 5,631,535). Claims 58, 59, and 62 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dierker in view of Koenck et al. (U.S. Patent No. 4,709,202). Claim 60 was rejected under Dierker in view of Dougherty et al. (U.S. Patent No. 5,316,868). Claims 37 and 60 were objected to due to various informalities. The drawings were objected to under 37 C.F.R. § 1.83(a) for not showing every feature of the invention specified in the claims. Lastly, the Examiner identified a minor informality in paragraph [0052] of the specification and requested Applicants to correct any other minor errors of which Applicants become aware. Reconsideration of this application is respectfully requested in view of the amendments and/or remarks provided herein.

Amendments to the Specification

2. Applicants have herein amended paragraph 0052 of the specification to correct the minor informality noted by the Examiner. Pursuant to the Examiner's request as stated in Paragraph 1 of the Office Action, Applicants have reviewed the specification for any additional minor informalities and have amended paragraph 0080 to correct such an informality. Applicants have also amended the title of the application to more accurately reflect the claimed subject matter. No new matter has been added by the aforementioned amendments to the specification.

Objections to the Drawings

3. The drawings were objected to under 37 C.F.R. § 1.83(a) for not showing every feature of the invention specified in the claims. In particular, the Examiner required that the

SCR, the heat sink, the main battery voltage sensor, the standby battery voltage sensor, the main battery amperage sensor, the standby battery amperage sensor, etc. be shown or the feature(s) cancelled from the claim(s). Applicants disagree with the Examiner's objection to the drawings and cancellation requirement.

37 C.F.R. § 1.81(a) provides the conditions under which a drawing must be provided in a patent application. In particular, 37 C.F.R. § 1.81(a) states that an "applicant for patent is required to furnish a drawing of his or her invention *where necessary for the understanding of the subject matter sought to be patented*" (emphasis added). On the other hand, 37 C.F.R. § 1.83 provides guidance as to the *content* of the drawings once drawings are deemed necessary. With respect to the elements noted by the Examiner, Applicants submit that drawings thereof are not necessary for one of ordinary skill in the art to understand the claimed subject matter. Persons of ordinary skill in the battery art would clearly understand Applicants' recitations of the aforementioned elements, namely, a silicon rectifier, a heat sink, a main battery voltage sensor, a standby battery voltage sensor, a main battery amperage sensor, and a standby battery amperage sensor, when considering such recitations after carefully and completely reviewing Applicants' specification.

Nevertheless, Applicants have cancelled all the pending claims and presented new claims herein that do not include the aforementioned elements. Accordingly, Applicants respectfully request that the Examiner withdraw the objection to the drawings.

Objections to the Claims

4. Claims 37 and 60 were objected to due to various informalities. Applicants have cancelled claims 37 and 60 herein, without prejudice or disclaimer, in favor of presenting new claims 88-105. Accordingly, Applicants respectfully request that the Examiner withdraw her objection to the claims.

Rejections under 35 U.S.C. §§ 102(b) and 103(a)

5. Claims 37-62 were rejected for various reasons under 35 U.S.C. §§ 102(b) and/or 103(a) in view of Dierker alone or in combination with Geibl et al., Dougherty et al. (U.S. Patent No. 5,162,164), van der Merwe, Koenck et al., and/or Dougherty et al. (U.S. Patent No.

5,316,868). Applicants have herein cancelled claims 37-62, without prejudice or disclaimer, and have presented new claims 88-105 for examination. The newly presented claims are not disclosed or suggested by any of the prior art of record, whether taken alone or in combination. In particular, all of the prior art references that include one-way charging or recharging of one battery while another battery is supplying electrical energy to a load, a combination of loads or any other electrical circuit also require that *both batteries be combined* in series or in parallel during some operational state of the electrical circuit, such as at startup of an engine. During the time that the prior art batteries are combined, *the combined batteries supply electrical energy to the electrical system simultaneously*. By contrast, as expressly recited in Applicants' claims, Applicants' apparatus and method are arranged such that the main battery and the standby battery(ies) *never supply* electrical energy to an electrical system *simultaneously*. As a result, Applicants' newly presented claims are believed to be patentable over the prior art of record.

Newly submitted claims 88 and 104 clearly and concisely recite that electrical energy (i.e., DC power) is supplied to an electrical system solely from a main battery when the invention's switching device is in a first switch position and solely from at least one standby battery when the invention's switching device is in a second switch position that is independent of the first switch position. Pursuant to all the new claims, the main battery and the at least one standby battery *never* source electrical energy to the electrical system *simultaneously*. Additionally, the newly submitted apparatus claims specifically recite a one-way charging circuit configured to facilitate charging of and the prevention of current flow from the at least one standby battery at all times during which the main battery is supplying electrical energy to the electrical system.

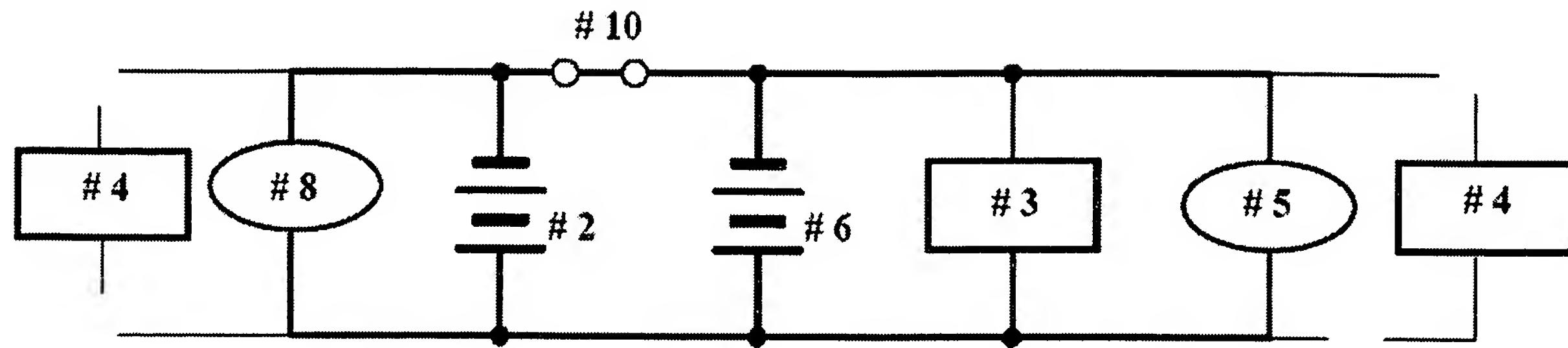
Since the Examiner has relied primarily upon Dierker in the present Office Action, Applicants discuss that reference in detail below with respect to the newly presented independent claims. In support of Applicants' arguments, Applicants submit herewith the Declaration of Mr. William J. Weiss under 37 C.F.R. § 1.132.

Dierker fails to teach or suggest several of the positively recited elements of the newly submitted independent claims. For example, Dierker specifically teaches that, during engine startup, the starter battery 2 and the vehicle electrical system battery 6 supply DC power *simultaneously* to all the identified loads 3, 4, 5, 8. As a result, Dierker's charging circuit 11

does not prevent current flow from the starter battery 2 at startup. Rather, both Dierker's starter battery 2 and Dierker's vehicle electrical system battery 6 jointly and simultaneously supply power during the startup operation. Thus, in contrast to Applicants' claims 88 and 104, Dierker does not provide a one-way charging circuit that prevents current flow from the starter battery 2 (analogous to the standby battery recited in Applicants' claims) at all times during which the vehicle electrical system battery 6 (analogous to the main battery recited in Applicants' claims) is supplying electrical energy to the electrical circuit. Additionally, in contrast to all of Applicants' newly presented independent claims, Dierker does not independently switch between a main battery and or one or more standby batteries, such that both the main battery and the standby battery(ies) *never* supply electrical energy to the load(s) or electrical circuit simultaneously. None of the various disclosed embodiments of Dierker provide all of the positively recited elements of Applicants' independent claims. Moreover, the engine starting mode of Dierker specifically teaches away from Applicants' positively recited claim elements and functionalities.

The Dierker reference discloses several embodiments of a multiple battery system, as schematically illustrated in FIGs. 1-6 thereof. (Weiss Decl. ¶ 5.) In each embodiment, the system is described and depicted as having both a starting mode and one or more non-starting or normal operational modes. (*Id.*) Notably, each depicted and disclosed embodiment of Dierker includes switches 7, 9, and 10 in the exact same locations. (*Id.*) The operations and functions of switches 7, 9, and 10 during engine startup (i.e., when the ignition switch 7 is closed) is described exclusively in column 2, lines 45-60 of Dierker. (*Id.*) Based on that disclosure, one of ordinary skill in the art would clearly understand that the crux of Dierker's startup operation in *all* disclosed embodiments is a parallel battery "boost" system, unlike Applicants' claimed system and method. (*Id.*)

The starting mode or operation for *all* embodiments disclosed in Dierker (FIGs. 1-6) simplifies to an identical electrical schematic of a basic parallel boost system as shown below in Schematic 1, which is presented here without discussion of the charge balancing between the starter battery 2 and the vehicle electrical system battery 6 and the MOSFETS and ancillary switches as are presented in FIGs. 3-6 of Dierker but which have no effect on the startup operation. (See col. 2, lines 45-60; see also Weiss Decl. ¶ 6.)



Schematic 1

Each embodiment has several switches 7, 9, 10, 12, 13, 14 that are selectively closed at engine startup as summarized in the table below, with annotations to the appropriate line and column numbers of Dierker indicating the position of each respective switch at startup. (Weiss Decl. ¶ 7.) As evident from the schematic above and the table below, *both* the vehicle electrical system battery 6 and the starter battery 2 are connected *in parallel* and *simultaneously* supply DC power to the electrical system loads 3, 4, 5, 8 at engine startup, which is diametrically opposite to the recitations of Applicants' newly presented claims.¹ (*Id.*)

Figure	Switch Status	Col. and Line Citation
Fig. 1	7, 9, 10 closed	Col. 2, Lines 45-55
Fig. 2	7, 9, 10 closed	Col. 2, Lines 45-55
Fig. 3	7, 9, 10 closed, 12 no effect	Col. 2, Lines 45-55 Col. 3, Lines 28-42
Fig. 4	7, 9, 10 closed 13 or 14 closed	Col. 2, Lines 45-55 Col. 3, Lines 43 thru Col. 4, Line 15
Fig. 5	7, 9, 10 closed 13 or 14 no effect	Col. 2, Lines 45-55 Col. 4, Lines 16-25
Fig. 6	7, 9, 10 closed 13 or 14 closed	Col. 2, Lines 45-55 Col. 4, Lines 25-33

Table A – Switch Positions for Dierker's Starting Mode

In each starting scenario, the ignition switch 7 is closed, which in turn closes switch 9. (*Id.* ¶ 9.) Switch 9 is illustrated in FIGs. 1-6 as being controlled by switch 7. (*Id.*) The closing of switches 7 and 9 causes the vehicle electrical system battery 6 and the starter battery 2 to be

¹ Note that load 4 is shown twice in dashed form because load 4 is positioned at one of the two depicted locations at engine startup depending upon the particular embodiment. For example, load 4 is coupled to the vehicle electrical system battery 6 in the embodiments depicted in FIGs. 1, 3, and 4-6 and is coupled to the starter battery 2 in the embodiment depicted in FIG. 2. (Weiss Decl. ¶ 8.)

positioned in parallel with one another so as to supply power simultaneously to the starter 8 and the other electrical loads 3, 4, 5 of the system 1. (*Id.*) In *all* embodiments disclosed in Dierker, switches 7, 9 and 10 close at startup to activate the starter 8, and only when the ignition switch 7 is engaged is a starting condition set. (*Id.*; Dierker, col. 2, lines 45-55.) There is no alternative means disclosed or suggested by Dierker for setting and/or sourcing DC power during a starting condition. (*Id.*) Dierker's switching arrangement 7, 9, 10 is not operable in a first position (e.g., with switches 7, 9, and 10 open as during normal operation) to electrically connect the positive output of the vehicle electrical system battery 6 to the electrical system 3, 4, 5 *and* electrically disconnect the positive output of the starter battery 2 from the electrical system 3, 4, 5, and in a second position (e.g., will switches 7, 9, and 10 closed as during startup) to electrically connect the positive output of the starter battery 2 to the electrical system 3, 4, 5 *and* electrically disconnect the positive output of the vehicle electrical system battery 6 from the electrical system 3, 4, 5. (*Id.* ¶ 10.) In no embodiment does Dierker disclose or suggest that the vehicle electrical system battery 6 and the starter battery 2 never supply electrical energy to the electrical system simultaneously. (*Id.* ¶ 11.) Instead, Dierker clearly discloses that *both* the vehicle electrical system battery 6 and the starter battery 2 *simultaneously source DC power* to the electrical system *during startup*. (*Id.*; *see also* Dierker, col. 2, lines 52-59 (closing of ignition switch 7 causes starter battery 2 and vehicle electrical system battery 6 to be connected *in parallel* and available for powering the primary load 4 and the starter 8).)

By contrast, the system of the present invention is drastically different from Dierker. (*Id.* ¶ 5.) In particular, the present invention is specifically designed to provide an electrical system operated from a main battery as the *sole source* of DC power in a first switch position *or* from an at least one standby battery as a *sole source* of DC power in a second switch position, but *never* from both the main battery and at least one standby battery simultaneously. (*Id.* ¶ 13.) Newly presented claim 88 positively recites a switching device operable in a first position to **electrically connect** the positive output of the main battery to the system positive terminal (i.e., the electrical system) **and electrically disconnect** the standby battery(ies) from the system positive terminal, thereby preventing the standby battery(ies) from supplying DC power to the electrical system during operation of the main battery. (*Id.* ¶ 14.) The claimed switching device is further operable in a second position independent of the first position to electrically connect the positive

output(s) of the standby battery(ies) to the system positive terminal and electrically disconnect the positive output of the main battery from the system positive terminal, thereby preventing the main battery from supplying DC power to the electrical system during operation of the standby battery(ies). (*Id.*) While independent claim 104 does not include the “positive output” and “positive terminal” terminology present in new claim 88, claim 104 clearly requires that the switching device be operable in a *first position* to *permit* electrical energy to *flow out of* the *main battery* to the electrical system *and prevent* electrical energy from *flowing out of* the at least one *standby battery* to the electrical system, and be further operable in a *second position* independent of the first position to *permit* electrical energy to *flow out of* the at least one *standby battery* to the electrical system *and prevent* electrical energy from *flowing out of* the *main battery* to the electrical system. (*Id.* ¶ 15.) Moreover, all three newly presented independent claims clearly recite that the main battery and the standby battery(ies) *never supply electrical energy to the electrical system simultaneously*. (*Id.*)

Thus, whereas Dierker starts with a “boost” battery system in which a starter battery 2 is brought together in parallel with another battery 6 during starting operation, Applicants’ claims clearly recite just the opposite (i.e., that the main battery and the standby battery(ies) *never supply electrical energy to the electrical system simultaneously*). (*Id.* ¶ 16.) Dierker expressly discloses his parallel connection requirement at column 2, lines 53-55. (*Id.*) The variations between Dierker’s embodiments of FIGs. 1-6 provide for different methods of powering the loads, specifically for powering load 4, after or before the start condition, *but not* at the start condition. (*Id.*) As a result, Dierker does not and cannot provide for the positively recited elements of the newly presented claims and specifically teaches away from such aspects of the claims. (*Id.*)

As a further distinction between Applicants’ newly presented apparatus claims and the disclosure of Dierker, Dierker discloses a one-way charging circuit 11 (in FIGs. 1-3) or 13, 14 (in FIGs. 4-6), however, Dierker’s charging circuit *does not* prevent current flow from the starter battery 2 during the starting operation when the vehicle electrical system battery 6 is also operating (i.e., when switches 7, 9, and 10 are closed). (*Id.* ¶ 17; *see also* Dierker, col. 2, lines 52-59 (closing of ignition switch 7 causes starter battery 2 and vehicle electrical system battery 6 to be connected in parallel). Instead, Dierker’s charging circuit 11 is bypassed by switch 10

during the starting operation and, therefore, cannot prevent current flow from the starter battery 2 during such operation. (*Id.*) As a result, Dierker's charging circuit 11 *does not* prevent current flow from the starter battery *at all times* during which the main battery is supplying DC power to the electrical system. (*Id.*)

By contrast, the apparatus claims of the present invention provide a one-way charging circuit configured to facilitate charging of and prevent current flow from the at least one standby battery *at all times* during which the main battery is supplying DC power to the electrical system. The instant invention provides a specific benefit in that the protection of the standby battery(ies) is present at *all* times the electrical system is sourced from the main battery. (*Id.* ¶ 18.) Such a recharging approach allows for a fully charged, fully functional standby battery to be available under all conditions during the operation of the electrical system in case of discharge or electrical fault of the main battery. (*Id.*) This is a significant advantage over systems like Dierker, McDermott and Dougherty, as discussed in Applicants' specification at paragraphs 0008 and 0009. (*Id.*)

As a further distinction between Applicants' newly presented claim 88 and the disclosure of Dierker, Dierker fails to provide for a switched connection to a single system positive terminal (depicted in Applicants' FIGs. 3B, 4B, and 5B as a single pole, multi-throw switch) by which only one of two or more positive battery outputs is electrically connected to the system positive terminal in such a way as to allow only one battery at a time to supply electrical energy to an electrical circuit. (*Id.* ¶ 19.) For example, in the switching position of Dierker in which switches 7, 9, and 10 are closed (i.e., at startup), both positive outputs of the batteries are electrically connected to the system positive terminal (i.e., the common positive node for the loads 3, 4, 5, 8 being sourced). (*Id.* ¶ 20.) On the other hand, in the switching position in which switches 7, 9, and 10 are open (i.e., during normal operation), the positive output of the vehicle electrical system battery 6 or the positive output of the starter battery 2 is electrically connected to the system positive terminal (i.e., the common positive node for the loads being sourced 3, 4, 5). (*Id.*) In addition, in certain embodiments, Dierker even discloses use of two system positive terminals during normal operation. (*Id.* ¶ 21.) For instance, in FIG. 2, the positive output of starter battery 2 is electrically connected to the positive terminal of load 4 (one system positive terminal); whereas, the positive output of vehicle electrical system battery 6 is separately

electrically connected to the positive terminal of parallel loads 3 and 5 (another system positive terminal) during normal operation. (*Id.*) Therefore, Dierker does not and cannot provide the switching device and resultant switched electrical connections between the main and standby positive outputs positively recited in Applicants' claim 88. (*Id.*)

In summary, the foregoing distinctions between Dierker and the various claims of the present invention are indicative of the unique capabilities of the instant invention. These aspects of the invention allow for at least one standby battery to be maintained in a fully charged state when a main battery is supplying DC power to an electrical circuit. (*See id.* ¶ 22.) In the event that the main battery is discharged for any reason (e.g., due to an improperly functioning alternator or otherwise), the standby battery can be immediately switched into operation to supply power to the electrical circuit without having to contend with the load of the discharged battery. (*Id.*) The electrical system can then be fully operated by the standby battery until the main battery is repaired, replenished, or replaced. (*Id.*)

Therefore, based on the foregoing, Dierker fails to disclose or suggest all the limitations of Applicants' newly presented independent claims. Moreover, Applicants have reviewed the other references of record and, based on their review, submit that neither Dierker nor any of the other references, whether taken alone or in combination, disclose or suggest the recitations of Applicants' newly presented claims. As a result, Applicants respectfully request that the Examiner withdraw her rejections under 35 U.S.C. §§ 102 and 103 and pass newly presented claims 88-105 to allowance.

New Claims

6. Applicants have herein added new claims 88-105 and cancelled pending claims 37-62. Claims 1-36 and 63-87 were withdrawn responsive to a prior restriction requirement. Applicants submit that new claims 88-105 are fully supported by Applicants' originally filed specification and are patentably distinct from the prior art of record. In particular, support for the new claims can be found in the specification at the locations listed in the following table:

Claim No.	Specification Support
88	FIGs. 3B & 4B; paras. 0033, 0035, 0046, and 0083-0089
89	Para. 0034
90	Para. 0036
91	FIG. 1; paras. 0037 and 0075
92	FIG. 1; paras. 0037 and 0075
93	FIGs. 2A & 2B; para. 0082
94	Paras. 0025 and 0026
95	Para. 0039
96	Paras. 0039 and 0040
97	Para. 0040
98	FIG. 5B; paras. 0080 and 0090
99	FIG. 7; para. 0096
100	Para. 0096
101	FIG. 9; paras. 0098 and 0099
102	FIG. 9; para. 0099
103	FIGs. 3B, 4B & 5B; para. 0080
104	FIGs. 3B & 4B; paras. 0033, 0035, 0046, and 0083-0089
105	FIGs. 3B & 4B; paras. 0033, 0035, 0046, and 0083-0089

Accordingly, Applicants request that the Examiner pass new claims 88-105 to allowance. With the addition of claims 88-105 and the cancellation of claims 37-62, eighteen claims remain pending in the present application, three of which are independent. Applicant had previously paid for examination of eighty-seven claims, four of which were independent. Therefore, Applicant has not added any extra claims by virtue of the present amendment. As a result, no additional fee is believed due for examination of the pending claims. If any additional fee is due for examination of the pending claims, please charge such additional filing fee to the

undersigned's Deposit Account No. 50-1111 and provide a supporting explanation for the additional fees in the Examiner's next correspondence.

Request for Interview

7. Given the continuing nature of the prosecution of the present application and in an effort to move prosecution forward expediently, Applicants hereby request an in-person and/or telephonic interview with the Examiner under 37 C.F.R. § 1.133 if the Examiner determines that the foregoing amendments and remarks do not place the present application in condition for allowance. Applicants strongly believe that such an interview would allow Applicants to more clearly understand the basis for the Examiner's continued refusal of the application and would allow the Examiner to more clearly appreciate the crucial differences between the present invention and all the prior art of record in an effort to issue a valid and enforceable patent. Applicants would prefer an in-person interview, but Applicants recognize and appreciate the Examiner's time constraints and are therefore amenable to a telephonic interview if so deemed necessary by the Examiner. Applicants request that the Examiner contact the undersigned representative to coordinate a convenient date and time for conducting the interview.

8. The Examiner is invited to contact the undersigned by telephone, facsimile or email if the Examiner believes that such a communication would advance the prosecution of the instant application. Please charge any necessary fees associated herewith, including extension of time fees (if applicable and not paid by separate check), to the undersigned's Deposit Account No. 50-1111.

Respectfully submitted,
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~~RUNNING~~
RUNNING FROM MAIN BATTERY

Fig 3B

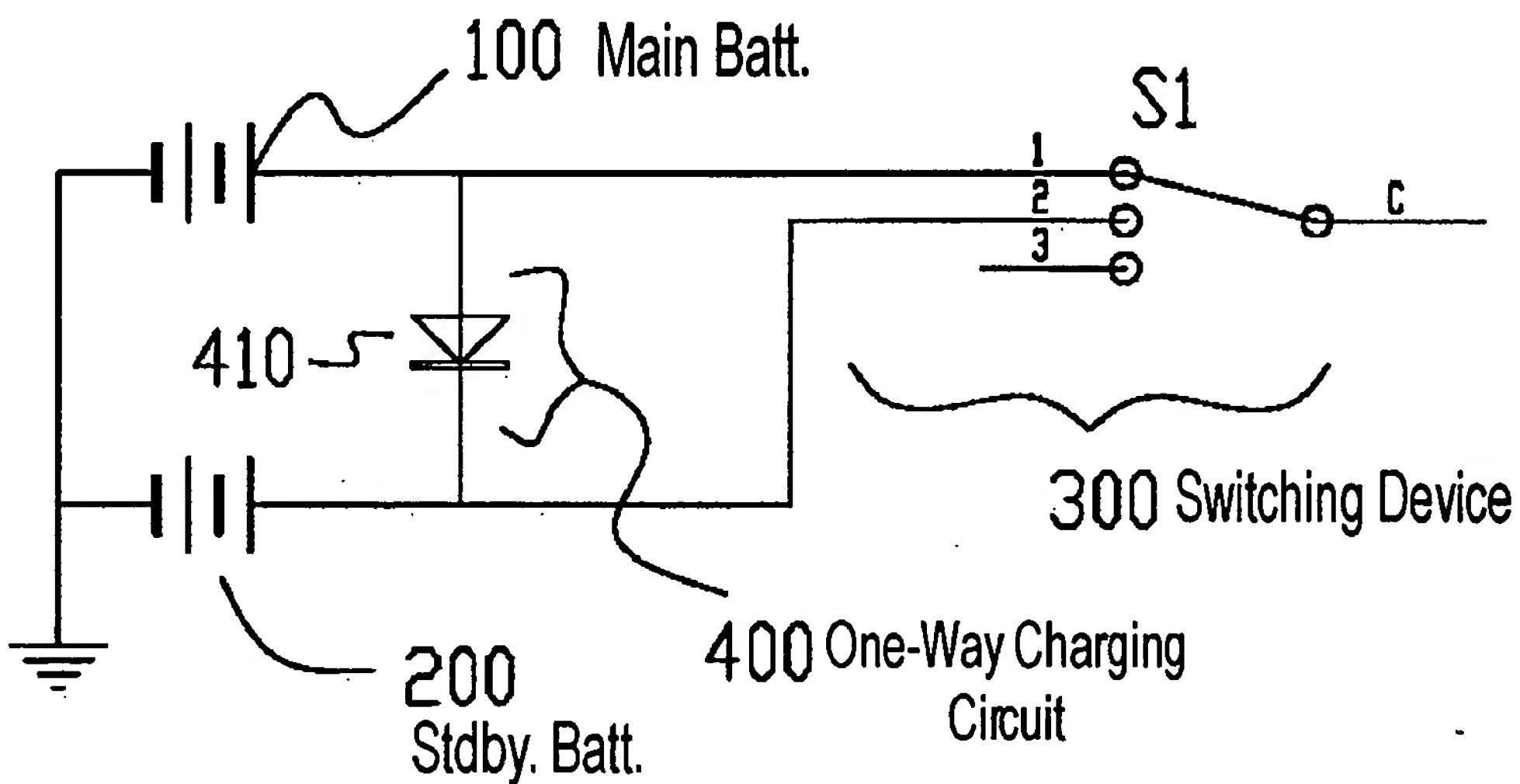


Fig 3A

